

Bedford very kindly offered to afford facilities for making new experiments at his own cost.

Mr. Lawes and Dr. Voelcker were requested to draw up a scheme for carrying on, at Woburn, such experiments as they, in communication with the Chemical Committee, might determine on. His grace offered to give up for the purpose Crawley Mill Farm, comprising about ninety acres, with the house and buildings. But, on examination, it was found that there was no sufficient area on that farm so even in character, and in condition, of soil, as to render it available for a considerable series of comparative field experiments. Eventually, after inspection of many others, a large field of much more suitable land was selected; on Birchmoor Farm. Crawley Mill Farm is, however, also retained, as a means of providing a residence for the Superintendent of the experiments, the requisite buildings, and the opportunity of having at command the necessary horse and hand labour for the experiments. Mr. P. H. Cathcart, formerly at the Royal Agricultural College, Cirencester, has been appointed the Resident Superintendent of the experiments.

As experiments to determine the value of the manure obtained by the consumption of purchased foods obviously involved the necessity of feeding animals under conditions in which the manure could be collected with as little loss as possible, the Duke of Bedford has erected eight very complete feeding boxes, in which the manure for the experimental barley and root crops recently sown has been made.

The field devoted to the field experiments has an area of twenty-seven acres; the soil has been carefully tested all over, and an account taken of the history of the field since 1874.

It was considered important, especially with reference to valuations under the Agricultural Holdings' Act, to add, if possible, to our knowledge of the manure-value of both artificial manures and consumed feeding stuffs; and it was decided, therefore, both to compare the effects of the manure obtained by the consumption of selected purchased foods, with those obtained by artificial manures estimated to supply the same constituents, and also to determine the effects of dung and artificial manuring substances, applied year after year, on the Woburn soil, and to compare these with the results obtained for so many years, with the same manures, on the very different soil at Rothamsted. Accordingly, $2\frac{1}{2}$ of the six acres where wheat had been grown in 1876, after tares and turnips, each fed with cake, are devoted to the continuous growth of wheat, and $2\frac{1}{2}$ acres to the continuous growth of barley. In each case the area is divided into eleven plots, of a quarter of an acre each.

The description and quantities of the manures for these experiments have been so carefully selected that in the end valuable results must be obtained as to the comparative value of various kinds of artificial manure as compared with farmyard manure, the constituents of which are accurately known. Two of the plots are unmanured; seven are manured with artificial manure of more or less complicated composition, and two with farmyard manure estimated to contain different proportions of nitrogen. In connection with the farmyard manure an accurate record is kept of the kinds and quantities of food from which it is produced, as also of the increase in the live-weight of the stock thus fed.

Besides these continuous experiments a series of rotation experiments—seeds, wheat, roots, barley, in successive years from 1877 to 1881—are to be carried out. The stock which is to supply the farmyard manure for these experiments is to be fed with decorticated cotton-cake, which among purchased feeding stuffs has a very high manure value, and maize-meal, which has a very low manure value. The effects of the manures obtained by the consumption of these foods will be compared with those of artificial manures supplying, in one case the same

amount of nitrogen, potass, phosphoric acid, &c., as is estimated to be contained in the manure from the cotton-cake consumed, and in another the same as in that from the maize-meal consumed. Accordingly, four feeding experiments have been conducted, in each of which the same amount of litter has been used, and the same amount of roots, and the same amount of wheat-straw chaff consumed. In Experiment 1, 1,000 lbs. decorticated cotton-cake were given in addition; and in Experiment 2, 1,000 lbs. maize-meal. In Experiments 3 and 4 no purchased food was given; but in Experiment 3 artificial manures estimated to contain the same amount of the chief constituents as the manure from 1,000 lbs. of cotton-cake, and in Experiment 4 the same as from 1,000 lbs. maize-meal, will be applied to the land, in addition to the root and chaff manure.

Four areas of four acres each have been devoted to these rotation experiments, eight of them coming into exact experiment this year, and the remaining eight in 1878. Each area of four acres is again divided into four plots, each of the latter sub-divisions bearing the same crop during the rotation of four years, but undergoing different treatment in the way of manure. For example, rotation No. 1, now under seeds, is treated as follows. Each plot is being separately fed by sheep. Plot 1 with cotton-cake; Plot 2 with maize-meal; and Plots 3 and 4 without purchased food. But, for the succeeding wheat, artificial manure estimated to contain nitrogen, and other constituents, in amounts equal to those in the manure from the consumed cotton-cake, will be applied to Plot 3, and artificial manure, equal to that from the consumed maize-meal will be applied to Plot 4. For the roots in 1879 (succeeding the wheat), the 4 acres will be manured as already described, and barley will complete the course in 1880. The other rotations are so treated as at the end of the four years to yield a collection of data that must be of the highest value in agricultural chemistry, and therefore to practical agriculture. In a "Statement" as to the objects and plan of the experiment which lies before us, full details are given on all points, and carefully constructed tables relating to every stage of the experiments, which show that all possible care has been taken to secure accuracy and practical utility in the results. The experiment will no doubt be anxiously watched by all interested in scientific agriculture.

NOTES

PROF. FRANKLAND, D.C.L., F.R.S., has now in the press a volume containing his collected researches in Pure, Applied, and Physical Chemistry, dedicated to Prof. Bunsen, of Heidelberg. The section on Pure Chemistry treats, amongst other matters, of the Isolation of the Organic Radicals, and the Discovery of Organo-Metallic Bodies, and their Application to the Synthetical Production of Organic Compounds. In the section devoted to Applied Chemistry, the author describes his Investigations on the Manufacture of Gas for Illuminating Purposes; on the Qualities of Potable Waters; and on the Treatment of the Sewage of Towns. Physical Chemistry includes his Experiments upon Flames, and upon the Source of Muscular Power, together with those on the Spectra of Gases and Vapours. Each chapter is preceded by introductory remarks, having reference to the scope, object, and future development of the subject treated of. Mr. Van Voorst is the publisher.

A MOVEMENT has been commenced in Spain for the formation of an association similar to the British Association. The Madrid Societies of Natural History, Anthropology, and Geography have appointed a joint commission to consider how best to organise an annual meeting in different parts of the kingdom for the purpose of investigating matters of scientific interest within the domain of these societies, and also to arrange for the publication of the results that may thus be obtained. A movement

like this leads one to hope that a fair future is yet in store for Spain.

It is probable that the Sixth Congress of Russian Naturalists will not be held this year, the Government not having granted a sum of money for the expenses of the Congress, and private help being unlikely to be forthcoming on account of the war.

THE fifth session of the International Congress of the Medical Sciences will be held at Geneva, from September 9 to 15. In connection with the Congress there will be an exhibition of new apparatus and instruments used in medicine, surgery, physiology, &c. Articles for exhibition should be sent free of all charges to the "Direction de l'Exposition du Congrès Médical; Dr. J. L. Reverdin, place du Lac, Geneva." Intending exhibitors should intimate before August 15 what space they are likely to require.

WE hope shortly to give an account of the proceedings which took place in connection with the recent Gauss centenary celebration. We may here state that the festival speech was delivered by Prof. Dr. Sommer, that a sketch for a monument by the Berlin sculptor, Schæfer, was exhibited in the Festival Hall, and that his Majesty, the Emperor of Germany, was a contributor to the Memorial Fund. The following pamphlets have appeared:—"Briefe zwischen A. von Humboldt und Gauss. Herausgegeben von Dr. K. Bruhns;" "Gauss. Ein Umriss seines Lebens und Wirkens. Von F. A. T. Winnecke;" "Über die Anzahl der Ideal-Classen in den verschiedenen Ordnungen eines endlichen Körpers. Von R. Dedekind." The committee also intend to publish an account of Gauss's relations with Brunswick.

FRANCE appears to be becoming more and more anxious to do honour to her science worthies by the erection of statues. A statue to Arago is being erected at Perpignan, in the department of Orientales Pyrénées. Another to Niepce de Saint-Victor, a name well known in connection with improvements in photography, will be erected at Chalons, his native place, by public subscription, at the instance of the Municipal Council of the city. It is also stated that a public subscription will be opened at Lyons on behalf of Ampère, the inventor of the electro-magnet, and the precursor of Faraday in the invention of the inductive electricity. Ampère was born in that city in 1775, and his father was guillotined there on the Place des Terreaux for having been active in the great royalist rebellion against the Convention, which ended in the famous siege of Lyons and his capture by Dubois-Crancé.

AT the usual fortnightly meeting of the Royal Geographical Society on Monday, a paper on "Journeys up the Niger and Notes on the Neighbouring Countries," by Bishop Crowther, was read. The paper, which dealt with the journeys of Bishop Crowther in Western Africa, between 1841 and 1871, described the character of the river Niger, the villages of the natives upon its banks, the tribes scattered about the neighbouring countries, &c. It was remarked that the actual extent of the delta of the river was still uncertain, but the lecturer inclined to the opinion that the affluents of the river, and particularly the Bénoué, on the south bank, if traced to their source would lead to a rich field of discovery. What might be called the delta of the river was a vast tract of marshy country extending along a coast line of 120 miles, and probably in parts some 150 miles in breadth. In the course of the journey of some 700 miles no less than thirteen tribes, speaking as many different languages, were met with. Ten of the tribes appeared to be of the same family, and might be classed as aboriginal. The Housas was a tribespread in the widest direction, and the territory in which their language was spoken appeared to be more considerable than any in Africa. It was a beautiful language, and had become to Africa what French is to Europe. The other important language of that part

of Africa was the Fulah. The Filanis were a remarkable people who had conquered extensive parts far to the south of the river Bénoué. Dr. Barth stated that he had been told by natives of the interior that in bygone days an ancient kingdom called Ghanata had existed. The trade routes which meet the Egga on the Niger were important; the chief came from the north, from Tripoli, across the Sahara, with European produce on camels to the Nupe kingdom, where it was distributed in the neighbouring countries. It has been resolved by the Church Missionary Society to send out a small steamer, drawing only three feet of water, to push further into the interior, and afford assistance to Bishop Crowther to carry the missionary work more completely among the natives.

A MUSEUM of Science and Arts has been established at St. Louis, U.S.

WE are glad to learn that the experiments with Jablochhoff's Electric Light are to be repeated at the West India Dock to-morrow evening. We hope all will go well and fairly on this occasion so as to allow a real test to be made of the practical utility of the invention.

AN Italian optician established in Paris has constructed a very sensitive metallic thermometer on a new principle. The dilations of a small sheet of platinised silver are amplified by means of a system of levers, and the motion is communicated to a needle on a dial, on which degrees are marked. The motion of the needle is almost instantaneous. The apparatus has been tested in the "Ville de Paris," a new balloon sent up on June 3 at Paris.

THE St. Petersburg Society of Naturalists has intrusted Professors Fr. Schmidt and Inostrantseff with a geological exploration of the Valley of the Neva, from Schlüsselburg down to the Finnish Gulf. From the interest possessed by the glacial accumulations in this valley, as well as the qualifications of both professors for this special subject, we may expect much new light on the question of the glaciation of Northern Russia.

THE *Turkestan Gazette* gives the latest news from M. Prshevsky, dated from Lob Nor, February 22. After having reached this lake by the valley of the Lower Tarim, M. Prshevsky advanced 130 miles east of the lake. The survey and the astronomical measurements of latitudes and longitudes he has made give a totally new aspect to the map of the country. The population on the banks of the Tarim and around the Lob Nor is very sparse; the people speak almost the same language as that of Eastern Turkestan. The flora and fauna of the locality are very poor; some vegetation is found only in the Tarim valley, the neighbourhood being a true desert. During February and March M. Prshevsky was to stay in the Lower Tarim, during May at Yuldus, and during June at Kunghe. About the beginning of July he proposes to return to Kuldsha to begin in August his journey to the Tibet.

THE *Gardener's Chronicle* learns that it is proposed to erect at Ootacamund, in the Neilgherry Hills, a statue of the late Mr. MacIvor, to whom the successful cultivation of Cinchona on those Indian slopes is so pre-eminently due.

WE see from the Report of the Auckland (New Zealand) Institute for 1876-7, that that society is in a flourishing condition, and that during the year thirteen papers on subjects of scientific importance in connection with the Colony were read. About a year ago a fine new museum was opened, the cost of building having been 4,000*l.*, half of which was raised by private subscription and half obtained as a grant from the New Zealand Government.

AT a recent meeting of the St. Petersburg Technical Society, M. Chikolef made an interesting communication as to

the experiments recently made at St. Petersburg for determining the lighting power of the electrical light at great distances. The power of the light is notably increased by covering the carbon of the lamp with a thin sheet of copper (one-sixteenth of the diameter of the carbon at its upper part, and from one-forty-eighth to one-sixty-fourth in its lower part). It depends also upon the direction given to the carbon, the best being to turn the cup towards the object to be lighted. The great machine of Alteneck, with a carbon of 12 millim. of diameter, gave a *maximum* of light equal to 10,210 candles, and a mean of 5,739 candles; whilst with a carbon of 10 millim., but galvanised, it gave a maximum of 16,255 candles (20,275 when the cup is turned as above) and a mean of 14,039 candles. The light was sufficient to make objects visible (for military purposes) at a distance of 3,080 yards. Of many machines used, the most economical proved to be the great one of Alteneck.

THE Society for Improvement of Public Health in Utrecht, offers a prize of 100 gulden for the best work on the liquid manure of stables, giving (1) an accurate account of the literature of the subject; (2) a description of original experiments on the means of obtaining from horse urine diluted with water, products which, either as manure or as a chemical preparation, may be brought into commerce in comparatively large quantities; (3) full numerical tables on quantitative chemical analyses made; (4) a thorough treatment of the financial side of the question. The memoirs may be written in Dutch, German, French, or English, and are to be sent, with sealed envelope and motto, to Prof. Dr. Th. Mac Gillvory, Director of the Veterinary School in Utrecht, before September, 1878.

THE very interesting discoveries in prehistoric archæology made by M. Kibalchich at Kief, were the subject of his last communication at the Russian Archæological Society. The numerous caves in the limestone on the banks of the Dnieper seem to have been a favourite haunt of men, even during the first ten centuries of our era. Very important objects have been found in these caves dating from the time of the introduction of Christianity in Russia, showing a remarkable mixture of articles used in Pagan and in Christian worship, establishing a link between Christian and Indian religious symbols. We notice especially those caves at Kief which date from the earliest stone period. They are very long, sinuous, but narrow, and contain great quantities of the plainest stone weapons and stone pearls, together with burned bones of various animals. Some facts lead us to infer the existence of lake-dwellings in the vicinity. Close to these oldest dwelling-places there exists a profusion of conic mounds of boulders and *koorganes* (high mounds of earth), or burial-places, coming from times anterior to the introduction of Christianity in Russia. They contain skeletons, often without skulls, which are buried separately, and a variety of weapons and utensils. The number of such burial-places at Kief and in its neighbourhood is very large. One cemetery of that epoch occupies twenty-three acres in the Fundukley Street, without reckoning the numerous "kitchen-mounds." The objects excavated by M. Kibalchich will form, it is hoped, the nucleus of an archæological museum to be opened at Kief. The excavations are to be continued.

THE *Panama Star and Herald* of the 21st ult., states that the destructive tidal wave experienced at Callao and the ports to the north of that place extended as far south as the northern boundary of Chili, but how much further south was not known, as the telegraph communication had been interrupted. The almost complete destruction was reported of Antofagasta, Iquique, Arica, Tambo do Moro, Pabellon de Pica, and Ilo. Severe shocks of earthquake were felt, but they caused little damage. The destruction of life and property was caused by the frightful upheaval and ingress of the sea. At Arica the sea washed over

the town to the hill at the back of the church and destroyed much valuable property. The wreck of the United States steamer *Waterloo*, carried inland a couple of miles by the tidal wave of 1868, was again floated, and carried a mile or two further up the coast. The sea in some places rose over sixty feet, and the destruction of life and property is believed to have been enormous.

THE final report of the Sub-Wealden Exploration has just been issued by Mr. H. Willett. He reports that the depth attained on December 21 last year was 1,823 feet, and on April 12, 1,905 feet. On the last-mentioned date a letter was sent by the Diamond Boring Company, stating they used the best endeavours to reach a depth of 2,000 feet and had failed, owing to the want of lining permitting the hole to fall in on the rods and jamming them. Mr. Willett writes:—"The Sub-Wealden exploration is, therefore, brought to a close, and has proved conclusively that in the lowest part of the Wealden area no palæozoic rocks exist within 1,900 feet of the surface. That the search was justified, and that the scientific deductions of Prof. Prestwich, F.R.S., were entitled to the highest consideration may be found in the fact that palæozoic rocks of the Devonian period have been discovered (containing spiriferæ) in the boring made at the brewery of Sir Henry Meux and Co., at the corner of Tottenham-Court Road London." Mr. Willett adds: "The search should undoubtedly be further promoted in the valley of the Thames and at other points in the south-east of England."

M. FERDINANDO TOMMASI has recently constructed a "thermodynamic motor," in which work is done by the mere dilatation of a liquid (oil) without change of state.

MR. SAMUEL HIGHLEY writes us:—"In connection with Mr. Atkinson's letter as to the phenomena connected with Japanese mirrors, and the question as to their method of manufacture, a few years ago Prof. Pepper exhibited the reflected figure formed by these specula when illuminated by a beam of oxyhydrogen light upon the screen at the Polytechnic Institution. In his 'Cyclopædic Science' the question of the method of the production of such mirrors is fully discussed. During the time the Japanese mirrors were being exhibited at the Polytechnic, an English brass-worker tried to solve the problem and apparently discovered the secret of the Japanese makers. He found that taking ordinary brass and stamping upon its surface with any suitable die, not once, but three times in succession, upon exactly the same spot, grinding down and polishing between each act of stamping, a molecular difference was established between the stamped and unstamped parts, so that images of the pattern could be reflected from the finally-polished surface, just as with the Japanese specula, though no difference of surface could be detected by the eye. One operation did not produce this result. Mr. James Princeps published an account of his investigations on this subject in the *Journal of the Asiatic Society*, vol. i., p. 242. He gives as the result of his analysis of the Japanese alloy, copper, 80 parts; tin, 20—100; with no traces of silver or arsenic, but a slight indication of zinc. He supposed that the phenomena resulted from difference of density produced by means of stamping, and that the thinnest parts, from being the hardest, should give the stronger reflection."

IN the last number of the *Transactions* of the Institution of Engineers and Shipbuilders in Scotland is a paper read April 24, by Sir Wm. Thomson, on Compass Adjustment on the Clyde, the aim of the paper being to show that the Clyde is pre-eminently suitable for the adjustment of the compasses of ships under way.

THE ninth annual report on the noxious, beneficial, and other insects of the State of Missouri, by Chas. V. Riley, the State Entomologist, contains descriptions (with woodcuts) of the fol-

lowing insects :—The gooseberry span-worm (*Eufithecia ribearia*, Fitch), the imported currant worm (*Nematus ventricosus*, Klug.), the native currant worm (*Pristiphora grossularie*, Walsh), the strawberry worm (*Emphytus maculatus*, Norton), Abbot's white pine worm (*Lophyrus abbotii*, Leach), and Le Conte's pine worm (*Lophyrus le contei*, Fitch). There is an account of the progress of the Colorado beetle, the army worm, the wheat-head army worm, and the Rocky Mountain locust.

MUSCULAR contraction, it is known, is always accompanied with electric phenomena; the difference of electric potential between two points of a muscle, undergoes a diminution, which, according to Bernstein, precedes by about $\frac{1}{100}$ of a second, the contraction of the muscle. This electric variation has been observed on various muscles, and in particular on the heart (by Du Bois Reymond and Kühne), and recently M. Marey has represented it graphically by photographing the indications of a Lippmann capillary electrometer. We learn from the *Journal de Physique*, that M. De la Roche has tried the experiment on the heart of a living man. Two points of the epidermis of the chest were connected with the poles of a capillary electrometer, by means of electrodes, formed each of a bar of amalgamated zinc, with a plug of muslin at its lower end saturated with sulphate of zinc. Held with insulating handles, the bars were applied, one with its plug opposite the point of the heart, under the left nipple, and the other to another point of the chest. The mercurial column was then seen to execute a series of very distinct periodical pulsations synchronous with the pulse; each pulsation even marked the double movement of the heart (of the auricles and ventricles). The amplitude corresponded to about $\frac{1}{1000}$ Daniell.

We have received from Perthes of Gotha a special map of Eastern Turkey, by Dr. Petermann, so full of details that for the war operations on and beyond the Danube, should the Russians succeed in crossing, we know of no better.

A RUSSIAN work, by M. Bogolubsky, on Gold and Gold Mining in Russia, is worthy of notice. It contains very interesting information upon that industry in Russia and Siberia. We observe that the area of gold mines occupies in the Russian empire about 2,100,000 square miles, and now yields yearly about 80,000 lbs. of gold, in value upwards of 3,000,000*l.* sterling. The total amount of gold produced in Russia since 1752 has been upwards of 2,500,000 lbs.

A VERY thorough and exhaustive investigation of the Alaska region may now be expected, through the agency of Mr. E. W. Nelson, a well-known naturalist, who has lately proceeded to Norton Sound, by way of Alaska, to relieve Mr. Turner. He has been provided with the necessary outfit by the Smithsonian Institution, and will probably greatly increase the amount of our knowledge of that interesting country.

We have received from Mr. Stanford "Botanical Tables for the Use of Junior Students," by Miss Arabella B. Buckley. There are two tables—one of some common terms used in describing plants, and the other a table of the chief natural orders of British plants, arranged according to Bentham and Oliver. Both tables are well arranged, and seem to us well calculated to serve the purpose for which they are intended.

M. MEGUIN has lately been making important researches on Acarians, and on that strange asexual form called Hypopes, a form which is not absolutely necessary for reproduction, but which seems to occur under certain biological conditions, for the indefinite conservation of the species. In the aerial reservoirs of birds, especially Gallinaceæ, there breeds an inoffensive species, which M. Meguin calls *Kytodites glaber*, which sends colonies even into the bronchial branches, and into the marrowless bones of the limbs in communication with the air vessels in birds. Another

harmless acarian is found in the cellular tissue of birds living and dying there, and persisting after death, surrounded by a calcareous tubercle. A third species, which lives normally between the barbs of the feathers, produces at the time of moulting, and in the skin of the birds, especially domestic and wild pigeons, a hypopial vermiform nymph. Without this precaution of nature, the species would be annihilated, by reason of the fall of the feathers in the moulting season.

THE additions to the Zoological Society's Gardens during the past week include a Lesser White-nosed Monkey (*Cercopithecus pataurista*) from West Africa, presented by Mrs. Cleaver; a Common Buzzard (*Buteo vulgaris*), European, presented by Mr. F. Buckland; a Smooth Snake (*Coronella levis*) from Hampshire, presented by Lord Lilford, F.Z.S.; three Crested Guinea Fowls (*Numida cristata*), two Vulturine Guinea Fowls (*Numida vulturina*) from East Africa, an Imperial Eagle (*Aquila imperialis*) from Turkey, deposited; four Summer Ducks (*Aix sponsa*), bred in the Gardens.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

OXFORD.—In a Convocation held June 5, the decree authorising the expenditure of 7,000*l.* on the construction and fittings of new chemical laboratories at the University Museum, to which we referred p. 94, was introduced by Prof. H. Smith, and carried on a division by 64 against 42.

A second proposal to grant a sum of 2,400*l.* for additions to the University Observatory was carried on a division by 46 placets to 27 non-placets.

The Trustees of the Johnson Memorial Prize for the encouragement of the study of astronomy propose the following subject for an essay:—"The History of the Successive Stages of our Knowledge of Nebulae, Nebulous Stars, and Star-Clusters from the Time of Sir Wm. Herschel." The prize is a gold medal of the value of ten guineas, with what remains of the dividends of four years on 338*l.*, reduced annuities, after deducting cost for medals, and other expenses. The essays must be sent to the Registrar of the University on or before March 31, 1879, under the usual conditions.

CAMBRIDGE.—A curatorship in the Department of Zoology at the Museum of the University of Cambridge has just been established by the Senate, to which Mr. J. F. Bullar, B.A., of Trinity College, has been appointed. Mr. Bullar graduated in the first class of the Natural Sciences Tripos of 1875, and has been twice nominated by the University to study at the Zoological Station at Naples, where he is at present working.

The various special examinations for the Ordinary B.A. Degree were held on Friday and Saturday week, when the total number of candidates was 204, while at the corresponding period of 1876 the number was 190. Candidates can select one of the following subjects for this final examination, viz., Theology, Law, Modern History, Natural Sciences, Moral Sciences, Mechanism, and Applied Science. The number in each branch of study is as follows:—Theology, 95, Law, 31, Political Economy, 29; Modern History, 24; Natural Sciences, 21—viz., 13 in Chemistry, 5 in Botany, 2 in Zoology, 1 in Geology. In Mechanism and Applied Science there are four candidates.

Mr. William Napier Shaw, B.A., has been elected a fellow of Emmanuel College. He graduated as 16th Wrangler in the Mathematical Tripos of 1876, and obtained a first-class in the Natural Sciences Tripos, 1877, being distinguished in physics.

LONDON.—The Council of University College have elected Mr. G. D. Thane Professor of Anatomy for two years.

DORPAT.—The Annual Report of the Dorpat University for 1876, gives the number of students at the University as 815, of whom 86 study theology, 173 jurisprudence, 121 history and philology, 363 medicine, and 72 physics and mathematics. The number of professors is 67. The library of the University numbers 138,924 volumes.

RUGBY SCHOOL NATURAL HISTORY SOCIETY.—The Report of this Society for 1876, shows that it is in a "fairly healthy condition," to use the words of the preface. A considerable